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The Moderating Role of Gender between Motivation and Attitudes Towards Physical Education

El papel moderador del género entre la motivación y la actitud hacia la educación física

A função moderadora do gênero entre a motivação e a atitude em relação à educação física

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ABSTRACT

This study aims to examine the moderating role of gender in the relationship between motivation and attitudes in physical education lessons in secondary schools. Hierarchical regression analysis was used to analyse the data. As a result, gender was found to have a moderating effect on the relationships between attitude and both external regulation and amotivation. Accordingly, the relationships between attitude and external regulation and amotivation were more negative for male than for females. The study has several implications for researchers, practitioners, and teachers. In conclusion, in order for male students to develop better attitudes towards physical education lessons, there is a need for physical education environments that will help them to adopt more self-determined forms of motivation.

KEYWORDS: amotivation, gender, physical education, secondary schools, self-determined motivation.

RESUMEN

El objetivo de este estudio es examinar el papel moderador del género en la relación entre motivación y actitudes en las clases de Educación Física en la escuela secundaria. Para ello, se realizó un análisis de regresión jerárquica con los datos. El análisis reveló que el género tiene un efecto moderador en las relaciones entre la actitud y la regulación externa, y la desmotivación. En consecuencia, las relaciones entre la actitud y la regulación externa y la amotivación fueron más negativas para los hombres que para las mujeres. El estudio tiene varias implicaciones

para investigadores, profesionales y profesores. En conclusión, para que los estudiantes varones desarrollen mejores actitudes hacia las clases de educación física, es necesario un entorno educativo que les ayude a adoptar formas de motivación más autodeterminadas.

PALABRAS CLAVE: desmotivación, género, educación física, escuelas secundarias, motivación autodeterminada.

RESUMO

Este estudo tem como objetivo examinar o papel moderador do género na relação entre motivação e atitudes nas aulas de educação física do ensino secundário. Para tanto, foi utilizada uma análise de regressão hierárquica. Constatou-se que o género exerce um efeito moderador sobre a relação entre atitude, regulação externa e desmotivação. Consequentemente, as relações entre atitude, regulação externa e amotivação foram mais negativas para os homens do que para as mulheres. O estudo tem várias implicações para pesquisadores, profissionais e professores. Em conclusão, para que os alunos do sexo masculino desenvolvam melhores atitudes em relação às aulas de educação física, é necessário um ambiente educacional que os ajude a adoptar formas de motivação mais autodeterminadas.

PALAVRAS-CHAVE: amotivação, gênero, educação física, escolas secundárias, motivação autodeterminada.

INTRODUCTION

Over the past three decades, motivation has been central to many social psychological theories that seek to explain behaviour, particularly to Self-Determination Theory (SDT) (Hagger & Chatzisarantis, 2007). This theory provides an understanding of people's behaviour by distinguishing different types of moti-

vation, ranging from autonomous motives to controlling motives. According to SDT, there is a motivational continuum from more self-determined to less self-determined forms of motivation (Deci & Ryan, 1985).

The most self-determined form is intrinsic motivation, which represents participation in an activity because of the interest, satisfaction, and enjoyment derived from it. On the other hand, extrinsic motivation involves engaging in an activity for external benefits or rewards. Extrinsic motivation is divided into four types of behaviour regulation: integrated and identified regulation, which are considered to be self-determined or autonomous regulatory styles; and introjected and external regulation, which are considered to be non-self-determined or controlled regulatory styles. Amotivation, on the other hand, represents the lack of motivation, and it corresponds to those individuals who are neither intrinsically nor extrinsically motivated (Amado et al., 2016).

The theory implies that this motivational continuum is not a developmental continuum or a stage model, but rather a conceptual continuum. Consequently, an individual may adopt a behaviour regulation anywhere on this continuum, depending on prior experiences and social and situational factors (Ryan & Deci, 2002). Similarly, Ryan and Deci (2007) have found that the autonomy continuum was replicated across cultures in many domains, including sport and exercise, even in collectivist cultural contexts. SDT has also been considered as an important framework for explaining the motivational processes underlying exercise and sport behaviour (Hagger & Chatzisarantis, 2007). It has been also applied in Physical Education (PE) (Standage & Gillison, 2007).

A critical review conducted by Van den Berghe, Vansteenkiste, et al. (2014) highlighted the pedagogical importance of SDT-based research in PE contexts. They recommended that if we want to achieve more valuable results, we need to focus on (a) needs-based practices (Aelterman et al., 2013), (b) inter-

vention and experimental studies (Cheon & Reeve, 2013), (c) understanding teacher behaviour (Van den Berghe, Soenens et al., 2014) and (d) paying more attention on PE-related contextual factors (Kalajas-Tilga et al., 2019).

There are few studies that highlight the importance of gender in explaining how motivation is affected by gender when other factors are involved in PE settings. In line with this, Haichun et al. (2017) have recommended that future studies investigate the effect of gender on students' motivational profiles in PE. More recently, Lochbaum et al. (2019) conducted a meta-analysis of 2x2 performance goals in sport and physical activity contexts. Their results showed that, contrary to their hypotheses, females didn't endorse performance avoidance more than males.

Another meta-analytic study carried out by Guérin et al. (2012) found that the effect size of the difference between men and women on each of the regulations (motivational regulations) was close to zero. Whitehead (1993) has stated that intrinsic motivation is driven by an innate need for competence and self-determination in dealing with one's environment. Basic psychological needs for autonomy, competence, and relatedness, are satisfied by feelings of competence, autonomy and relatedness, positive emotions such as enjoyment and excitement, and possibly a sense of flow.

However, according to Deci and Ryan (1991), student or institutional characteristics should not moderate the three universal basic psychological needs of autonomy, competence, and relatedness, because they depend on internal motivation in a particular domain of activity. However, Guiffrida et al. (2013) found that gender influenced their model based on SDT theory. Conversely, Chirkov et al. (2003) found that neither gender nor other demographic factors moderated the relationship between autonomy and well-being.

Perhaps one reason for the ambiguous results mentioned above is the creative inquiry technique, while the use of a direct

instruction technique seems to be more appropriate initially with females (Amado et al., 2016). PE is an excellent place to develop student's knowledge and positive attitudes toward the practice of physical activity, and to promote regular adherence to these activities. Nevertheless, there are few studies that have investigated the moderating role of gender in PE settings, and most of them have shown inconsistent results.

Cairney et al. (2012) examined the relationship between gender, perceived athletic competence, and enjoyment of PE lessons in a longitudinal study. They found that gender had no effect on the enjoyment of PE for children who perceived themselves as more competent in sports and athletics. They also reported that the enjoyment of PE decreased for girls but remained stable for boys, and that these differences increased over time.

Most of the studies in the literature (Donovan et al., 2015; Mercier et al., 2016; Mercier et al., 2017; Phillips & Silverman, 2012; Simonton et al., 2019) have examined students' attitudes towards PE settings. Children's attitudes have been identified as a key element influencing participation in physical activity (Hagger et al., 1997). Hagger et al. (2002) have also highlighted the importance of understanding the attitudes and intentions towards physical activity. Their meta-analytic review, it has been also reported that attitude-intention was the possible moderator of physical activity.

According to Arabaci (2009), because gender and age play an important role in attitudes towards PE, many studies have compared the attitudes of girls and boys of different ages. For example, some of the previous cross-sectional studies (Birtwistle & Brodie, 1991; Silverman & Subramaniam, 1999; Whitehead, 1993; Williams & Gill, 1995) have reported that girls enjoy PE less than boys. Activity preferences and attitudes in PE lessons may differ (Smoll & Schutz, 1980) in terms of gender (Birtwistle & Brodie, 1991; Papaioannou, 1994), age (Mercier et al., 2017), grade (Mašanović, 2019), perceptions (Zeng et al., 2011), and

socio-economic status (McVeigh et al., 2004; Stalsberg & Pedersen, 2018).

Motivation and attitudes have also been examined together in the literature. For example, Säfvenbom et al. (2015) found that children in Norway were dissatisfied with PE lessons, with girls having less positive attitudes than boys. Digelidis et al. (2003) and Morgan and Carpenter (2002) reported that creating a task-involving motivational climate in PE supported the development of more positive attitudes towards PE lessons. Atan and Imamoglu (2016) investigated students' attitudes towards PE. Their results showed that attitudes did not differ between the ages of 11–14-year-olds, and variables such as gender, age, class, and income status did not affect attitudes.

Based on the above studies, it can be concluded that there are inconsistent findings regarding the effect of gender on attitudes towards PE. Therefore, this study was conducted to determine whether gender has a moderating effect on the relationship between motivation and attitudes towards PE.

METHODOLOGY

Participants and Procedure

Participants in this study were 719 secondary school students (379 males and 340 females) aged 11-14 years from five different public high schools in the city of Mersin, Turkey. Firstly, permission to conduct the study was given by the Provincial Directorate for National Education and the study was conducted according to the Declaration of Helsinki. Permission to collect the data from the classrooms was obtained from the principals of the, and the children gave their verbal consent to participate before the study began. The schools where the current study would be conducted were contacted to explain the purpose and

the procedure of our research, and to obtain permission to interview the students.

Informed consent and parental authorisation forms were completed prior to data collection. In addition to verbal information, participants were given an information sheet explaining the aims of the study was given to the participants. Students were informed that participation was voluntary and that the questionnaires were anonymous. Participants were also told to ask for help if they were confused about the instructions or the clarity of the items. The questionnaires were completed during the PE lessons. Each participant took about 10-20 minutes to complete the questionnaires.

Instruments

Situational Motivation Scale for Physical Education

The Situational Motivation Scale for Physical Education (SIMS-PE) was administered to assess students' level of situational motivation. The original measure was developed by Guay et al. (2000) and consists of 16 items assessing four types of motivation, namely intrinsic motivation, identified regulation, external regulation, and amotivation. Participants were asked to indicate their reasons for participating in PE on a 7-point scale. In the current study, the Turkish version which was adapted by Daşdan Ada et al. (2012) was used.

Daşdan Ada et al. (2012) reported that the results of confirmatory factor analysis provided good support for the construct validity ($\chi 2/df = 2.62$, RMSEA = .06, NFI = .94, NNFI = .96, CFI = .97, GFI = .93, and AGFI = .89). Cronbach's alpha coefficients for PE were acceptable and more specifically .71 for intrinsic motivation, .72 for identified regulation, .79 for external regulation, and .78 for amotivation.

Attitude to Physical Education Lesson Questionnaire

The questionnaire was developed by Pehlivan (1998) to assess students' attitudes towards PE lessons and consists of 22 items. Participants rate their agreement with the statements on a 5-point Likert scale. The total score ranges between 22 and 110. A high score on the scale indicates a positive attitude of the student towards PE. The Cronbach's alpha coefficient of the instrument, the validity and reliability of which was examined by Pehlivan (1998), was reported to be .94.

Data Analysis

The data obtained were analysed using descriptive statistics, including means and standard deviations. We also performed Pearson correlation coefficients (Table 2) and then moderated hierarchical regression analyses to examine the additive and interactive effects of motivation and gender on attitudes. The data collected from these participants were tested for assumptions of multicollinearity, and tolerance (was greater than .20). Finally, the slope test was used to examine the nature of the interactions.

RESULTS

The descriptive statistics of the whole sample (n_{boys} = 340; n_{girls} = 379) showed above-average and high scores for attitude (M = 82.60; SD = 16.21 for boys; M = 85.20; SD = 17.11 for girls), intrinsic motivation (M = 5.52; SD = 1.31 for boys; M = 5.85; SD = 1.19 for girls) and identified regulation (M = 5.40; SD = 1.37 for boys; M = 5.69; SD = 1.35 for girls). In contrast, the mean scores for external regulation (M = 3.67; SD = 1.70 for boys; M = 3.98; SD = 1.85 for girls) and amotivation (M = 2.96; SD = 1.53 for boys; M = 3.60; SD = 1.88 for girls) are below the average for both genders. Bivariate correlations showed that

attitude was significantly correlated with all the situational motivators (Table 1). The coefficients ranged from low to high, and all were statistically significant, except for the correlations between external regulation and intrinsic and identified regulation, and between amotivation and intrinsic motivation.

Table 1. *Correlation coefficients between all variables of the total sample*

	Scales	1	2	3	4	5
1	Intrinsic motivation	1				
2	Identified regulation	.731**	1			
3	External regulation	-.068	.003	1		
4	Amotivation	-.074	-.090*	.605**	1	
5	Attitude	.526**	.447**	-.306**	-.356**	1

Note. $*p < .05$, $**p < .01$.

Hierarchical Regression Analyses

Hierarchical regression analysis was used to examine the effect of gender on the relationships between students' motivation and attitudes towards PE. Table 2 shows the independent effects of intrinsic motivation and gender separately, as well as the interaction effect between intrinsic motivation and gender are given for the dependent variable (predicted variable) of attitude. It was found that intrinsic motivation [$F(2, 716) = 137.496$, $p < .01$] made a significant contribution to the regression model but gender did not. The corrected R^2 value for intrinsic motivation was .28.

These results indicate that a 28% of the variance in attitudes towards physical education is explained by intrinsic motivation alone. However, since the actual effect is only produced by intrinsic motivation only, and gender is meaningless in both Model 1 and Model 2, the significance of the interactive term is actually insignificant. This is because the first condition to be met in the moderation analysis, is that all independent variables have a significant effect on the dependent variable (Gürbüz & Şahin,

2018). Already, the reason for the significance of the interactive term is due to the effect of intrinsic motivation. Therefore, no moderating role of gender was found between intrinsic motivation and attitude.

Table 2. *Results of hierarchical moderated regression analysis for attitudes predicted by intrinsic motivation and gender*

	Steps	R^2	S.Beta Value	t	F	p
Model 1	Gender	.277	.033	1.04	137.49	.300
	Intrinsic motivation		.521	16.25		.000
Model 2	Gender	.284	.036	1.11	94.44	.267
	Intrinsic motivation		.514	15.99		.000
	Gender X Intrinsic motivation		-.080	-2.51		.012

Table 3 shows the interaction effect of identified regulation and gender variables, as well as the independent effects of identified regulation and gender on students' attitudes towards PE. It was found that identified regulation [F (2, 716) = 91.412, $p < .01$] made a significant contribution to the regression model, while gender did not. The corrected R^2 value of the identified regulation is .20.

Table 3. *Results of hierarchical moderated regression analysis for attitudes predicted by identified regulation and gender*

	Steps	R^2	S.Beta Value	t	F	p
Model 1	Gender	.203	.063	1.88	91.41	.060
	Identified regulation		.441	13.15		.000
Model 2	Gender	.214	.064	1.93	64.82	.054
	Identified regulation		.439	13.19		.000
	Gender X Identified regulation		-.102	-3.08		.002

These results show that a 20% of the variance in attitudes towards PE is explained by identified regulation. However, the significance of the interactive term is actually insignificant, because the real effect is through identified regulation and the effect of gender was insignificant in both Model 1 and Model 2. This is because the first condition to be met in the moderation analysis is that all independent variables have a significant effect on the dependent variable (Gürbüz & Şahin, 2018). Already the reason for the significance of the interactive term is the effect of the identified regulation. Therefore, gender does not play a moderating role in the relationship between identified regulation and attitude.

The results of the hierarchical regression analysis in Table 4 show that both external regulation [$F(2, 716) = 44.473$, $p < .01$] and gender contributed significantly to the first regression model (Table 4). The corrected R^2 value of the external regulation and gender is .11. These results indicate that the 11% of the variance in the attitude towards physical education is explained by gender and external regulation.

Table 4. *Results of hierarchical moderated regression analysis for attitudes predicted by external regulation and gender*

	Steps	R^2	S.Beta Value	t	F	p
Model 1	Gender	.110	.130	3.68	44.47	.000
	External regulation		-.316	-8.95		.000
Model 2	Gender	.128	.130	3.70	34.95	.000
	External regulation		-.326	-9.29		.000
	Gender X External regulation		.132	3.77		.000

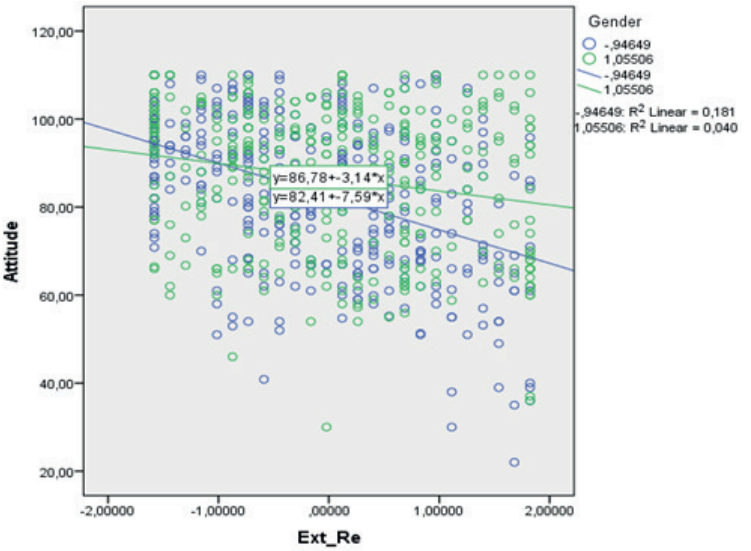
In the second step of the analysis of external regulation and gender, an additional 3% of the variance in attitude towards physical education course was explained by including the interac-

tion term in the regression, and this change in R^2 was significant [F (1,715) = 14.245, p < .01]. In the final model, both external regulation (B = -.33, p < .01) and gender (B = .13, p < .01) were found to have a significant effect on attitude. In addition, external regulation and gender had a significant interaction effect on attitude (B = .13, p < .01).

In the corrected R^2, the fact that the multiplicative result of external regulation and gender interaction is significant, shows that there is an interaction effect of these two variables on attitude. Following the recommendations of Aiken and West (1991), the effect size of the multiplicative result of external regulation and gender interaction was calculated as f2 = .15, and it was found to have a moderate effect (Cohen, 1988).

To determine the form and direction of the interaction between external regulation and gender, the effect of gender and extrinsic motivation on attitude is plotted in Figure 1. The figure shows that there is an interaction effect of external regulation and gender on individuals' attitudes. The slope was analysed using the slope test (Aiken & West, 1991). This test indicates whether the relationship between external regulation and attitude depends on gender. The relationship between external regulation and attitude was significant and negative for girls (B = -.20, p < .01), whereas this relationship was again negative and stronger for boys (B = -0.43, p < .01). These results suggest that the relationship between attitude and external regulation is moderated by gender.

Figure 1. *The moderating effect of gender and external regulation on the attitude*



Note. Blue lines for boys, green lines for girls.

The results of the hierarchical regression analysis in Table 5 also show that amotivation [F (2, 716) = 64.980, p > .01] and gender together contribute significantly to the regression model together. The corrected R^2 for amotivation and gender is .16. These results indicate that the 15% of the variance in the attitude towards physical education is explained by gender and amotivation.

In the second step of the analysis of amotivation and gender, an additional 8% of the variance in attitudes towards physical education was explained by including the interaction term in the regression, and this change in R^2 was found to be significant [F (1, 715) = 6.90, p < .01]. In the final model, amotivation (B = -.40, p < .01) and gender (B = .17, p < .01) were found to have a significant effect on attitude.

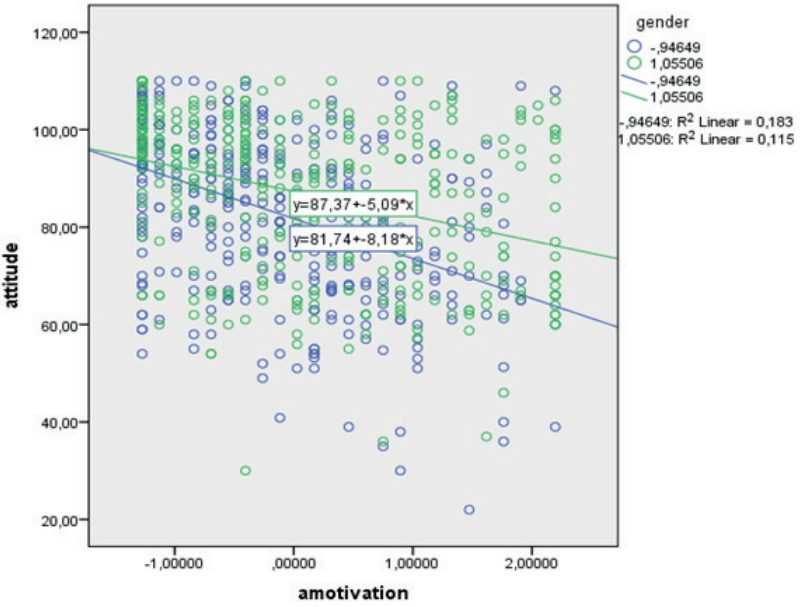
Table 5. *Results of hierarchical moderated regression analysis for attitudes predicted by amotivation and gender*

	Steps	R^2	S.Beta Value	t	F	p
Model 1	Gender	.154	.166	4.77	64.98	.000
	Amotivation		-.383	-10.99		.000
Model 2	Gender	.162	.167	4.82	45.98	.000
	Amotivation		-.400	-11.33		.000
	Gender X Amotivation		.092	2.63		.009

In addition, amotivation and gender had a significant interaction effect on attitude (B = .09, p < .01). In the corrected R^2, the fact that the multiplicative result of amotivation and gender interaction is significant shows that there is an interaction effect of these two variables on attitude. The effect size of the multiplicative result of external regulation and gender interaction was calculated as f2 = .19, and again it was found to have a moderate effect. The slope test was used to determine the form and direction of the interaction between amotivation and gender.

Figure 2 shows that there is an interaction effect of amotivation and gender on individuals' attitudes. The slope test shows whether the relationship between amotivation and attitude depends on gender. The relationship between amotivation and attitude was significant and negative for girls (B = -.34, p < .01), whereas this relationship was again negative and stronger for boys (B = -.43, p < .01). These results suggest that the relationship between attitude and amotivation is moderated by gender.

Figure 2. *The moderating effect of gender and amotivation on the attitude*



Note. Blue lines for boys, green lines for girls.

DISCUSSION

The aim of this study was to determine the moderating effect of gender in the relationship between motivation and attitudes towards physical education lessons. Overall, the initial results of the study suggest that boys in secondary school had lower scores on self-determined forms of motivation and also a lower score on attitude towards PE compared to girls. These findings strongly support those of previous studies on gender differences in motivation. When reviewing the literature, most researchers have found that male athletes are more externally regulated than female athletes (Fortier et al., 1995; Gillet & Rosnet, 2008; Kazak Çetinkalp, 2012; Miller, 2000; Pelletier et al., 1995).

Gender differences in motivation for physical activity may result from patterns of social expectations and social roles for men and women. Societal expectations of men, internalisation of these expectations over time, and/or the need to act in accordance with these expectations may result in men being more externally motivated. Another finding for male participants in this study was that their attitudes towards PE classes were lower than those of girls. The fact that they can find opportunities for physical activity in all circumstances may have contributed to boys' low attitudes towards PE lessons.

On the other hand, at present, children are currently becoming more passive and less active (Cui et al., 2018; Elmesmari et al., 2018). The fact that male students, in particular, prefer computer games to physical activity and spend most of their time on this platform can be seem as another reason for their negative attitude towards PE.

They found that intrinsic motivation and identified regulation were not related to gender, but external regulation and amotivation were. Ada et al. (2020) found that girls also had more self-determined forms of motivation (intrinsic motivation and identified regulation) and less self-determined forms of motivation (external regulation and amotivation).

When examining the relationships between students' motivation and attitudes towards PE courses, it was found that attitudes were negatively related to external motivation and amotivation, and positively related to self-determined forms of motivation (intrinsic motivation and identified regulation). The conditions in which individuals have self-determined forms of motivation to participate in an activity, are those in which individuals have a positive attitudes towards the environment in which they find themselves. Therefore, the relationships found in this study were considered an expected outcome.

Specifically, Bryan and Solmon (2012) found that intrinsic motivation and identified regulation were both positively corre-

lated with students' attitudes towards PE, while amotivation was negatively related to attitude constructs. Moreno Murcia et al. (2009) indicated that the self-determined motivation developed more positive attitudes towards PE among students. Similarly, some of the previous research (Chiu, 2009) also showed that the correlation between motivation for physical activity and attitude towards participation in physical activity was the highest.

PE classes helps students to develop their own sporting abilities and thus to develop also positive attitudes towards participating in sporting activities. In other words, the gains they make in PE environments will lead them to participate more in these activities for self-determined reasons, making them more self-determinedly motivated. The interaction between PE teachers and pupils is also important in developing positive attitudes towards PE and increasing motivation towards PE.

Bhavsar et al. (2020) suggest that if coaches involve their athletes in decision-making mechanisms, they will encourage them to develop more self-determined forms of motivation. Otherwise, non-self-determined forms of motivation may be adopted. Cognitive evaluation theory suggests that significant others for students at school are critical in determining whether intrinsic motivation is undermined or supported through their effects on students' feelings of autonomy and competence. Furthermore, Mohammed and Mohammad (2012) found that students respond positively or negatively to PE courses based on their previous experiences in PE. Therefore, this situation can also be considered as a factor that can directly influence students' motivation in PE.

This study found that gender has an effect on motivation and attitudes. This finding needs to be supported by future research. In the context of PE, there is also a need for more gender-specific studies to obtain clearer results.

The three universal basic psychological needs can vary according to many factors, especially culture. Therefore, gender

may be the most important variable in the PE context to obtain measurement invariance in self-determination theory. This also needs to be investigated in future studies.

Finally, it can be said that differently designed research models that will aim to examine the different factors that may promote or undermine students' self-determined motivation in the PE context, beyond our existing knowledge based on SDT, will be of particular importance in future research. Hassandra et al. (2013) found that one's intrinsic motivation was associated with both socio-environmental and individual factors.

The current study focused mainly on individual factors. Therefore, the current findings may not provide a good understanding of what other factors influence students' motivation in the context of PE lessons.

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DECLARATION OF COMPETING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, writing, and/or publication of this article.

REFERENCIAS

1. Ada, E. N., Comoutos, N., Bal, S. I., & Pehlivan, Z. (2020). The Relationships between Situational Motivation, Attitude and Self-Talk for Physical Education Lesson. *Sport Sciences*, *15*(4), 53-66. https://www.doi.org/10.12739/NWSA.2020.15.4.2B0127
2. Aelterman, N., Vansteenkiste, M., Van Keer, H., De Meyer, J., Van den Berghe, L., & Haerens, L. (2013). Development and Evaluation of a Training on Need-Supportive Teaching in Physical Education: Qualitative and Quantitative Findings. *Teaching and Teacher Education*, *29*, 64-75. https://doi.org/10.1016/j.tate.2012.09.001
3. Aiken, L. S., & West, S. G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Sage.
4. Amado, D., Del Villar, F., Sánchez-Miguel, P. A., Leo, F. M., & García-Calvo, T. (2016). Analysis of the Impact of Creative Technique on the Motivation of Physical Education Students in Dance Content: Gender Differences. *The Journal of Creative Behavior*, *50*(1), 64-79. https://doi.org/10.1002/jocb.69
5. Arabaci, R. (2009). Attitudes toward Physical Education and Class Preferences of Turkish Secondary and High School Students. *Elementary Education Online*, *8*(1), 2-8. https://www.researchgate.net/publication/228362422_Attitudes_toward_physical_education_and_class_preferences_of_Turkish_secondary_and_high_school_students
6. Atan, T., & Imamoglu, M. (2016). Attitudes of Secondary School Students towards Physical Education and Sports Lesson in Terms of Various Variables. *Turkish Journal of Sport and Exercise*, *18*(2), 65-68. https://dergipark.org.tr/en/pub/tsed/issue/24974/288250
7. Bhavsar, N., Bartholomew, K. J., Quested, E., Gucciardi, D. F., Thøgersen-Ntoumani, C., Reeve, J., Sarrazin, P., & Ntoumanis, N. (2020). Measuring Psychological Need States in Sport: Theoretical Considerations and a New Measure. *Psychology of Sport and Exercise*, *47*, Article 101617. https://doi.org/10.1016/j.psychsport.2019.101617

8. Birtwistle, G. E., & Brodie, D. A. (1991). Children's Attitudes towards Activity and Perceptions of Physical Education. *Health Education Research*, *6*(4), 465-478. https://doi.org/10.1093/her/6.4.465
9. Bryan, C. L., & Solmon, M. A. (2012). Student Motivation in Physical Education and Engagement in Physical Activity. *Journal of Sport Behavior*, *35*(3), 267-285. https://psycnet.apa.org/record/2012-22008-002
10. Cairney, J., Kwan, M. Y., Velduizen, S. Hay, J., Bray, S. R., & Faught, B. E. (2012). Gender, Perceived Competence, and the Enjoyment of Physical Education in Children: A Longitudinal Examination. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(26). https://doi.org/10.1186/1479-5868-9-26
11. Cheon, S. H. & Reeve, J. (2013). Do the Benefits from Autonomy-Supportive PE Teacher Training Programs Endure? A One-Year Follow-Up Investigation. *Psychology of Sport and Exercise*, *14*(4), 508-518. https://doi.org/10.1016/j.psychsport.2013.02.002
12. Chirkov, V., Ryan, R. M., Kim, Y., & Kaplan, U. (2003). Differentiating Autonomy from Individualism and Independence: A Self-Determination Theory Perspective on Internalization of Cultural Orientations and Well-Being. *Journal of Personality and Social Psychology*, *84*(1), 97-110. https://doi.org/10.1037/0022-3514.84.1.97
13. Chiu, L. K. (2009). University Students' Attitude, Self-Efficacy and Motivation Regarding Leisure Time Physical Participation. *Jurnal Pendidik dan Pendidikan*, *24*, 1-15. https://core.ac.uk/outputs/83543398/?utm_source=pdf&utm_medium=banner&utm_campaign=pdf-decoration-v1
14. Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. Routledge.
15. Cui, X., You, L., Zhu, L., Wang, X., Zhou, Y., Li, Y., Wen, J., Xia, Y., Wang, X., Ji, C., & Guo, X. (2018). Change in Circulating MicroRNA Profile of Obese Children Indicates Future Risk of Adult Diabetes. *Metabolism*, *78*, 95-105. https://doi.org/10.1016/j.metabol.2017.09.006

16. Daşdan Ada, E. N., Aşçı, F. H., Kazak, C. F. Z., & Altıparmak, M. E. (2012). Reliability and Validity of Situational Motivation Scale for Physical Education Class Environment. *SPORMETRE Beden Eğitimi ve Spor Bilimleri Dergisi*, *10*(1) 7-12. https://doi.org/10.1501/Sporm_0000000214
17. Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. Springer.
18. Deci, E. L., & Ryan, R. M. (1991). A Motivational Approach to Self: Integration in Personality. In R. A. Dienstbier (Ed.), *Nebraska Symposium on Motivation* (pp. 237-288). University of Nebraska Press.
19. Digelidis, N., Papaioannou, A., Laparidis, K., & Christodoulidis, T. (2003). A One-Year Intervention in 7th Grade Physical Education Classes Aiming to Change Motivational Climate and Attitudes towards Exercise. *Psychology of Sport and Exercise*, *4*(3), 195-210. https://doi.org/10.1016/S1469-0292(02)00002-X
20. Donovan, C. B., Mercier, K., & Phillips, S. R. (2015). Investigating Attitudes toward Physical Education: Validation across Two Instruments. *Measurement in Physical Education and Exercise Science*, *19*(2), 91-98. https://doi.org/10.1080/1091367X.2015.1012511
21. Elmesmari, R., Martin, A., Reilly, J. J., & Paton, J. Y. (2018). Comparison of Accelerometer Measured Levels of Physical Activity and Sedentary Time between Obese and Non-Obese Children and Adolescents: A Systematic Review. *BMC Pediatrics*, *18*, Article 106. https://doi.org/10.1186/s12887-018-1031-0
22. Fortier, M. S., Vallerand, R. J., & Guay, F. (1995). Academic Motivation and School Performance: Toward a Structural Model. *Contemporary Educational Psychology*, *20*(3), 257-274. https://doi.org/10.1006/ceps.1995.1017
23. Gillet, N., & Rosnet, E. (2008). Basic Need Satisfaction and Motivation in Sport. *Athletic Insight. The Online Journal of Sport Psychology*, *10*(3), 151-158. https://psycnet.apa.org/record/2009-01917-001
24. Guay, F., Vallerand, R. J., & Blanchard, C. M. (2000). On the Assessment of Situational Intrinsic and Extrinsic Motivation: The

Situational Motivation Scale (SIMS). *Motivation and Emotion*, *24*, 175-213. https://doi.org/10.1023/A:1005614228250
25. Guérin, E., Bales, E., Sweet, S., & Fortier, M. (2012). A Meta-Analysis of the Influence of Gender on Self-Determination Theory's Motivational Regulations for Physical Activity. *Canadian Psychology/ Psychologie canadienne*, *53*(4), 291-300. https://doi.org/10.1037/a0030215
26. Guiffrida, D., Lynch, M., Wall, A., & Abel, D. (2013). Do Reasons for Attending College Affect Academic Outcomes? A Test of a Motivational Model from a Self-Determination Theory Perspective. *Journal of College Student Development*, *54*(2), 121-139. https://doi.org/0.1353/csd.2013.0019
27. Gürbüz, S., & Şahin, F. (2018). *Research Methods in Social Sciences*. Seckin/Hukuk.
28. Hagger, M., & Chatzisarantis, N. (2007). *Intrinsic Motivation and Self-Determination in Exercise and Sport*. Human Kinetics.
29. Hagger, M., Ashford, B., & Stambulova, N. (1997). Physical Self-Perceptions: A Cross-Cultural Assessment in Russian Children. *European Journal of Physical Education*, *2*(2), 228-245. https://doi.org/10.1080/1740898970020208
30. Hagger, M., Chatzisarantis, N. L. D., & Biddle, S. J. H. (2002). A Meta-Analytic Review of the Theories of Reasoned Action and Planned Behavior in Physical Activity: Predictive Validity and the Contribution of Additional Variables. *Journal of Sport & Exercise Psychology*, *24*(1), 3-32. https://doi.org/10.1123/jsep.24.1.3
31. Haichun, S., Weidong, L., & Bo, S. (2017). Learning in Physical Education: A Self-Determination Theory Perspective. *Journal of Teaching in Physical Education*, *36*(3), 277-291. https://doi.org/10.1123/jtpe.2017-0067
32. Hassandra, M., Goudas, M., & Chroni, S. (2013). Examining Factors Associated with Intrinsic Motivation in Physical Education: A Qualitative Approach. *Psychology of Sport and Exercise*, *4*(3), 211-223. https://doi.org/10.1016/S1469-0292(02)00006-7
33. Kalajas-Tilga, H., Koka, A., Hein, V., Tilga, H., & Raudsepp, L. (2019). Motivational Processes in Physical Education and

Objectively Measured Physical Activity among Adolescents. *Journal of Sport and Health Science*, *9*(5), 462-471. https://doi.org/10.1016/j.jshs.2019.06.001
34. Kazak Çetinkalp, Z. (2012). Achievement Goals and Physical Self-Perceptions of Adolescent Athletes. *Social Behavior and Personality*, *40*(3), 473-480. https://doi.org/10.2224/sbp.2012.40.3.473
35. Lochbaum, M., Zanatta, T., & Kazak, Z. (2019). The 2 × 2 Achievement Goals in Sport and Physical Activity Contexts: A Meta-Analytic Test of Context, Gender, Culture, and Socioeconomic Status Differences and Analysis of Motivations, Regulations, Affect, Effort, and Physical Activity Correlates. *European Journal of Investigation in Health, Psychology and Education*, *10*(1), 173-205. https://doi.org/10.3390/ejihpe10010015
36. Mašanović, B. (2019). Gender and Age Differences in Attitudes of Serbian Pupils toward Physical Education Lessons and Their Preferences Regarding Lesson Organisation. *Croatian Journal of Education*, *21*(1), 213-231. https://doi.org/10.15516/cje.v21i1.3440
37. McVeigh, J., Norris, S., & de Wet, T. (2004). The Relationship between Socio-Economic Status and Physical Activity Patterns in South African Children. *Acta Paediatrica*, *93*(7), 982-988. https://doi.org/10.1111/j.1651-2227.2004.tb02699.x
38. Mercier, K, Donovan, C., Gibbone, A., & Rozga, K. (2017). Three-Year Study of Students' Attitudes Toward Physical Education: Grades 4–8. *Research Quarterly for Exercise and Sport*, *88*(3), 307-315. https://doi.org/10.1080/02701367.2017.1339862
39. Mercier, K., Phillips, S., & Silverman, S. (2016). High School Physical Education Teachers' Attitudes and use of Fitness Tests. *The High School Journal*, *99*(2), 179-190. https://doi.org/10.1353/hsj.2016.0001
40. Miller, P. S. (2000). *Student-Athletes' Perceptions of Psychosocial Development through Intercollegiate Athletic Participation* [Doctoral dissertation, University of Toronto]. http://hdl.handle.net/1807/14190
41. Mohammed, H. R, & Mohammad, M. A. (2012). Students Opinions and Attitudes Towards Physical Education Clas-

ses in Kuwait Public Schools. *College Student Journal*, *46*(3), 550-566.
42. Moreno Murcia, J. A., González-Cutre Coll, D., & Ruíz Pérez, L. M. (2009). Self-Determined Motivation and Physical Education Importance. *Human Movement*, *10*(1), 5-11. https://www.researchgate.net/publication/257100832_Self-Determined_Motivation_and_Physical_Education_Importance
43. Morgan, K., & Carpenter, P. (2002). Effects of Manipulating the Motivational Climate in Physical Education Lessons. *European Physical Education Review*, *8*(3), 207-229. https://doi.org/10.1177/1356336X020083003
44. Papaioannou, A. (1994). Development of a Questionnaire to Measure Achievement Orientations in Physical Education. *Research Quarterly for Exercise and Sport*, *65*(1), 11-20. https://doi.org/10.1080/02701367.1994.10762203
45. Pehlivan, Z. (1998). The Study of Development of the Attitude Scale towards Physical Education Lesson. In Spor Bilimleri Kongres (Org.), *5th International Congress of Exercise and Sport Sciences*. Hacettepe University.
46. Pelletier, L. G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., & Briere, N. (1995). Toward a New Measure of Intrinsic Motivation, Extrinsic Motivation, and Amotivation in Sports: The Sport Motivation Scale (SMS). *Journal of Sport & Exercise Psychology*, *17*(1), 35-53. https://doi.org/10.1123/jsep.17.1.35
47. Phillips, S. R., & Silverman, S. (2012). Development of an Instrument to Assess Fourth and Fifth Grade Students' Attitudes Toward Physical Education. *Measurement in Physical Education and Exercise Science*, *16*(4), 316-327. https://doi.org/10.1080/1091367X.2012.693359
48. Ryan, R. M., & Deci, E. L. (2002). Overview of Self-Determination Theory: An Organismic Dialectical Perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of Self-Determination Research* (pp. 3-33). University of Rochester Press.
49. Ryan, R. M., & Deci, E. L. (2007). Active Human Nature: Self-Determination Theory and the Promotion and Maintenance of Sport, Exercise, and Health. In M. S. Hagger, & N. L. D. Chatzisarantis (Eds.), *Intrinsic Motivation and Self-Determination in Exercise and Sport* (pp. 1-20). Human Kinetics.

50. Säfvenbom, R., Haugen, T., & Bulie, M. (2015). Attitudes Toward and Motivation for PE. Who Collects the Benefits of the Subject? *Physical Education and Sport Pedagogy*, *20*(6), 629-646. https://doi.org/10.1080/17408989.2014.892063
51. Silverman, S., & Subramaniam, P. R. (1999). Student Attitude toward Physical Education and Physical Activity: A Review of Measurement Issues and Outcomes. *Journal of Teaching in Physical Education*, *19*(1), 97-125. https://doi.org/10.1123/jtpe.19.1.97
52. Simonton, K. L., Mercier, K., & Garn, A. C. (2019). Do Fitness Test Performances Predict Students' Attitudes and Emotions Toward Physical Education? *Physical Education & Sport Pedagogy*, *24*(6), 549-564. https://doi.org/10.1080/17408989.2019.1628932
53. Smoll, F. L., & Schutz, R. W. (1980). Children's Attitudes Toward Physical Activity: A Longitudinal Study. *Journal of Sport and Exercise Psychology*, *2*(2), 137-147. https://doi.org/10.1123/jsp.2.2.137
54. Stalsberg, R., & Pedersen, A. V. (2018). Are Differences in Physical Activity across Socioeconomic Groups Associated with Choice of Physical Activity Variables to Report? *International Journal of Environmental Research and Public Health*, *15*(5), 922-945. https://doi.org/10.3390/ijerph15050922
55. Standage, M., & Gillison, F. (2007). Students' Motivational Responses Toward School Physical Education and Their Relationship to General Self-Esteem and Health-Related Quality of Life. *Psychology of Sport and Exercise*, *8*(5), 704-721. https://doi.org/10.1016/j.psychsport.2006.12.004
56. Van den Berghe, L., Soenens, B., Aelterman, N., Cardon, G., Tallir, I. B., & Haerens, L. (2014). Within-Person Profiles of Teachers' Motivation to Teach: Associations with Need Satisfaction at Work, Need-Supportive Teaching, and Burnout. *Psychology of Sport and Exercise*, *15*(4), 407-417. https://doi.org/10.1016/j.psychsport.2014.04.001
57. Van den Berghe, L., Vansteenkiste, M., Cardon, G., Kirk, D., & Haerens, L. (2014). Research on Self-Determination in Physical Education: Key Findings and Proposals for Future Research. *Physical Education and Sport Pedagogy*, *19*(1), 97-

121, https://doi.org/10.1080/17408989.2012.732563
58. Whitehead, J. (1993). Physical Activity and Intrinsic Motivation. *Research Digest*, *23*, 1-22. http://purl.access.gpo.gov/GPO/LPS21124
59. Williams, L. D., & Gill, D. L. (1995). The Role of Perceived Competence in the Motivation of Physical Activity. *Journal of Sport and Exercise Psychology*, *17*(4), 363-378. https://doi.org/10.1123/jsep.17.4.363
60. Zeng, H. Z., Hipscher, M., & Leung, R. W. (2011). Attitudes of High School Students Toward Physical Education and Their Sport Activity Preferences. *Journal of Social Sciences*, *7*(4), 529-537. https://doi.org/10.3844/jssp.2011.529.537